PROJECT REFERENCE NO.	SHEET NO.
5C.035046, 5C.091030, etc.	1

Ingleside

7

1,11

6

8

9

5

4

10

2012 FRANKLIN COUNTY ROAD IMPROVEMENTS

PROJECT REFERENCE NO.	SHEET NO.
5C.035046, 5C.091030, etc.	2

2012 VANCE COUNTY RESURFACING

Henderson

Epsom

Kittrell

14 1326 1444 1303 1304 1309 1392

12 1508 1507 1001 1519 1565 1518

16 1148 1585

13 1280 1101 1115 1113 1112 1101 1107 1101

2

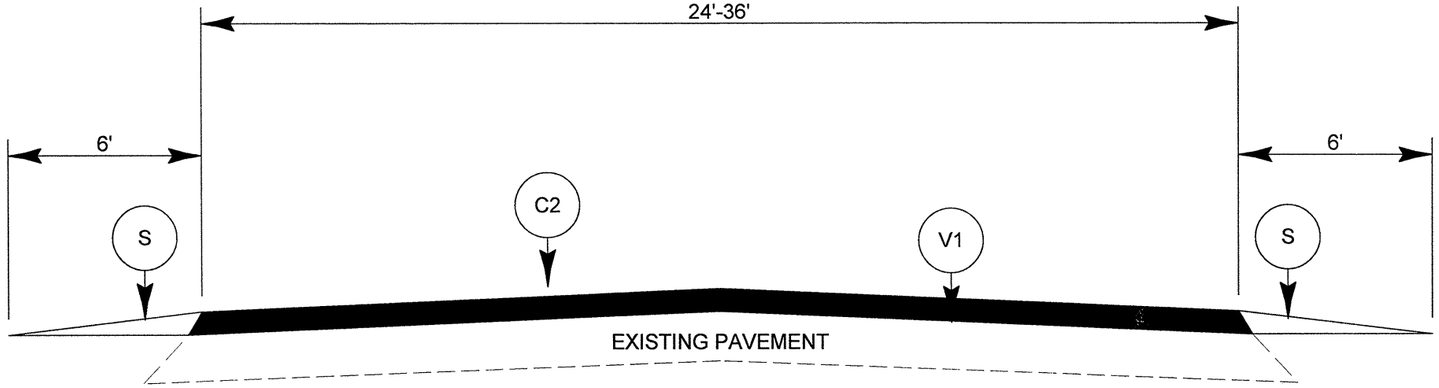
15 1546 1547 1549 1545

3 1519 1549 1550

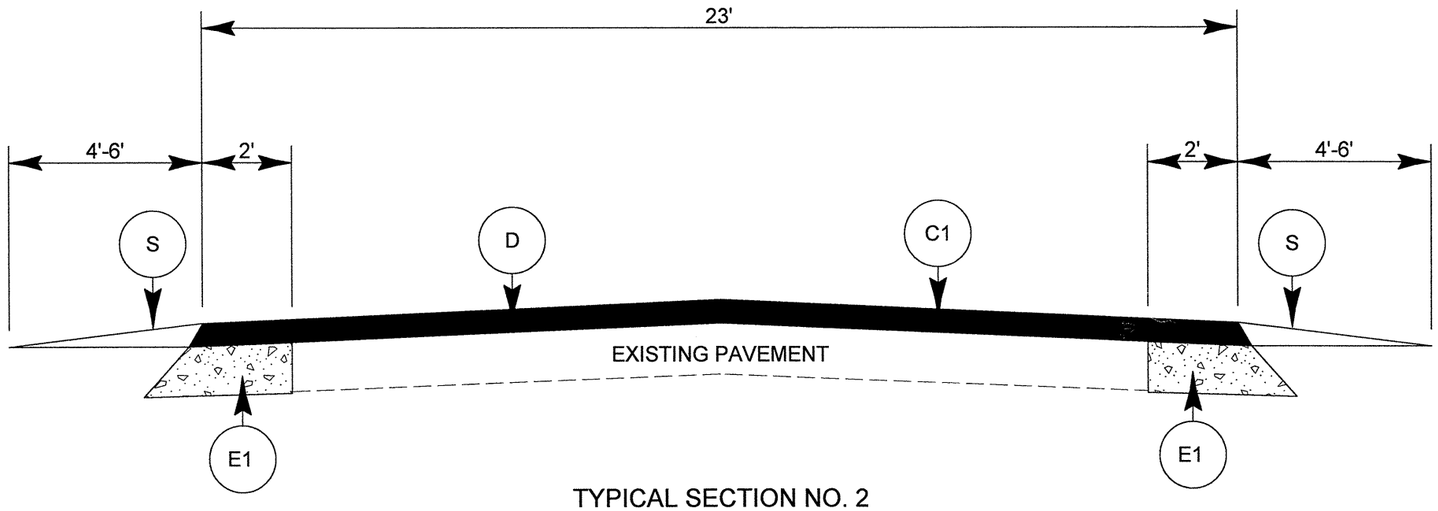
1553 1551 1557 1549

85 39 158 BYP 158 BUS 158 1

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5C.035046, 5C.091030, 5C.091034, ETC.	3	



TYPICAL SECTION NO. 1



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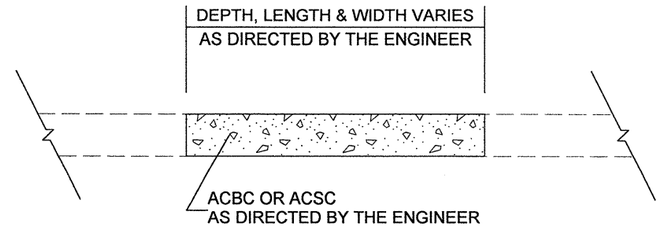
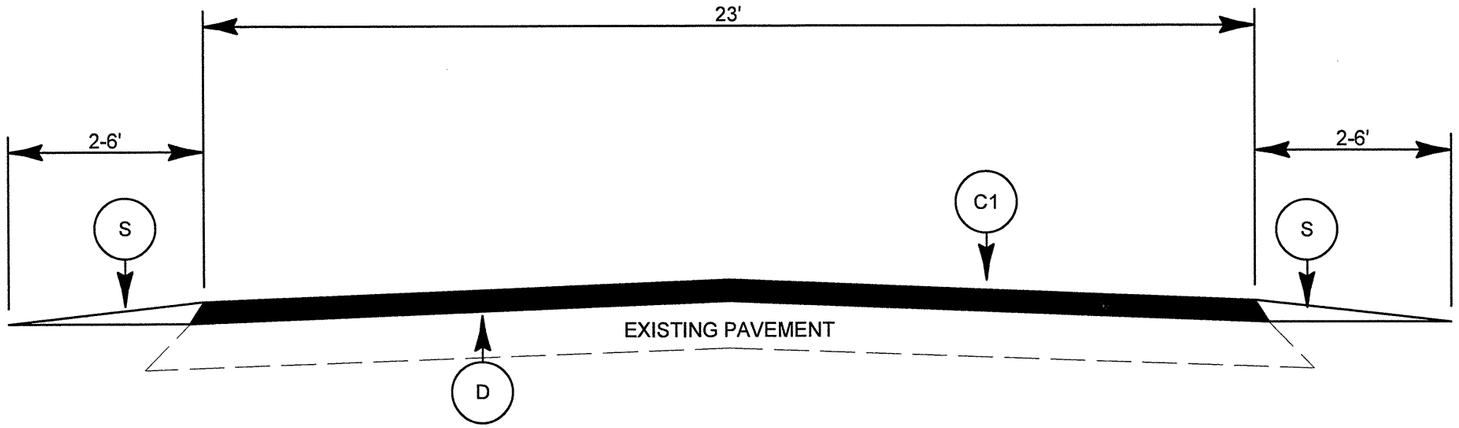
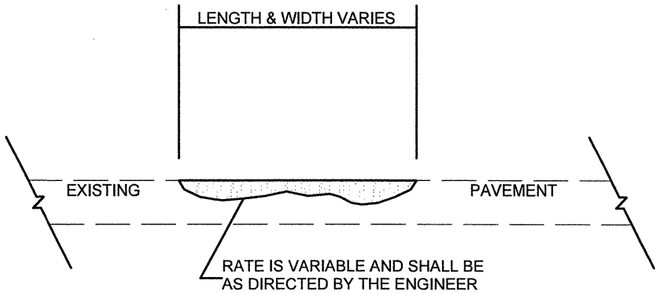


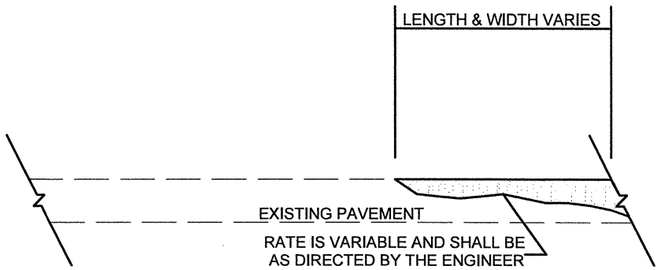
PATCHING EXISTING PAVEMENT PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" OF ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A ATA N AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5" OF ASPHALT SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. ASPHALT CONCRETE LEVELING COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ.YD. PER INCH OF DEPTH AS DIRECTED BY THE ENGINEER
D	PROP. APPRX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS PER SQ. YD.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E2	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE WIDENING, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS PER SQ. YD IN EACH OF TWO LAYERS TO PROVIDE 2' WIDENING AS DIRECTED BY THE ENGINEER
S	SHOULDER RECONSTRUCTION/SEEDING AND MULCHING/BORROW AS DIRECTED BY THE ENGINEER
V1	MILL 1.5"
V2	MILL 4"

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5C.035046, 5C.091030, 5C.091034, ETC.	4	

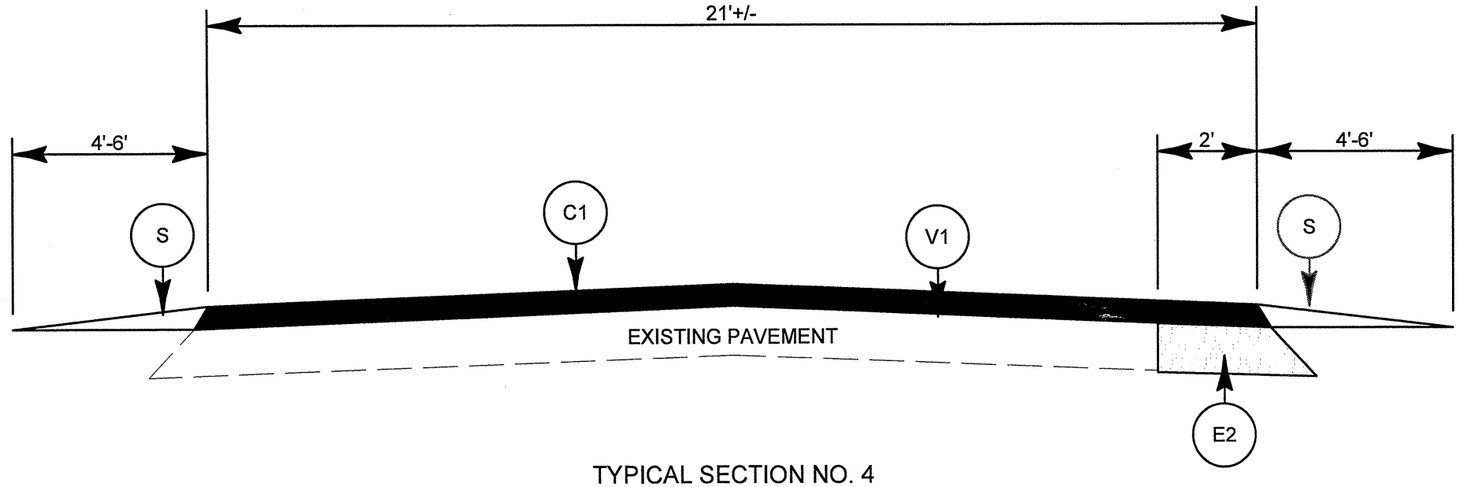


TYPICAL SECTION NO. 3

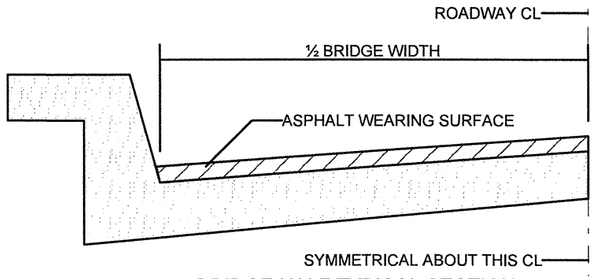




ASPHALT CONCRETE SURFACE COURSE
(LEVELING COURSE)



TYPICAL SECTION NO. 4



BRIDGE HALF TYPICAL SECTION

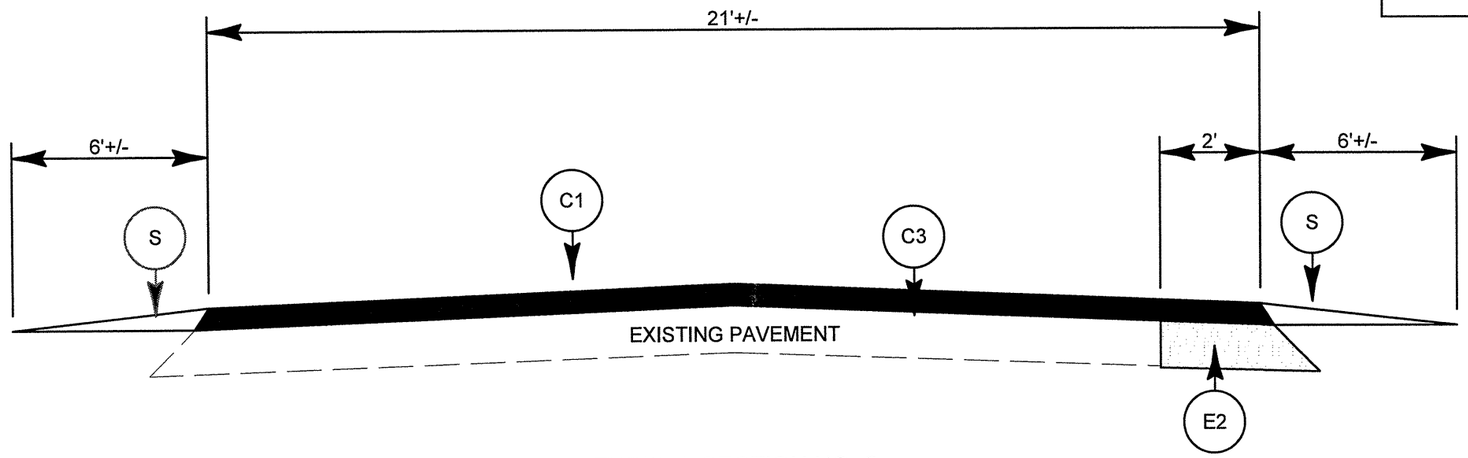
FOR BRIDGES WITH FLOOR DRAINS, CARE SHALL BE EXERCISED IN PLACING THE WEARING SURFACE AROUND FLOOR DRAINS SO AS NOT TO HINDER EFFECTIVE DRAINAGE. ALL DRAINS SHALL BE LEFT OPEN

THE PROPOSED WEARING SURFACE SHALL VARY IN THICKNESS AS NECESSARY TO PROVIDE A SMOOTH RIDING SURFACE. THE MINIMUM THICKNESS SHOULD DEPEND ON PAVEMENT TYPE AS FOLLOWS: S4.75A ½", SF9.5A 1.0", S9.5X 1.5", S12.5X 2.0", ULTRATHIN HOT MIX ASPHALT-TYPE A ¾", ULTRATHIN HOT MIX ASPHALT-TYPE B 5/8", ULTRATHIN HOT MIX ASPHALT-TYPE C ½".THE MAXIMUM THICKNESS SHOULD DEPEND ON PAVEMENT TYPE AS FOLLOWS: S4.75A 1.0", SF9.5A 1.5",S9.5X 2.0", S12.5X 2.0", ULTRATHIN HOT MIX ASPHALT-TYPE A ¾", ULTRATHIN HOT MIX ASPHALT-TYPE B 5/8", ULTRATHIN HOT MIX ASPHALT-TYPE C ½".

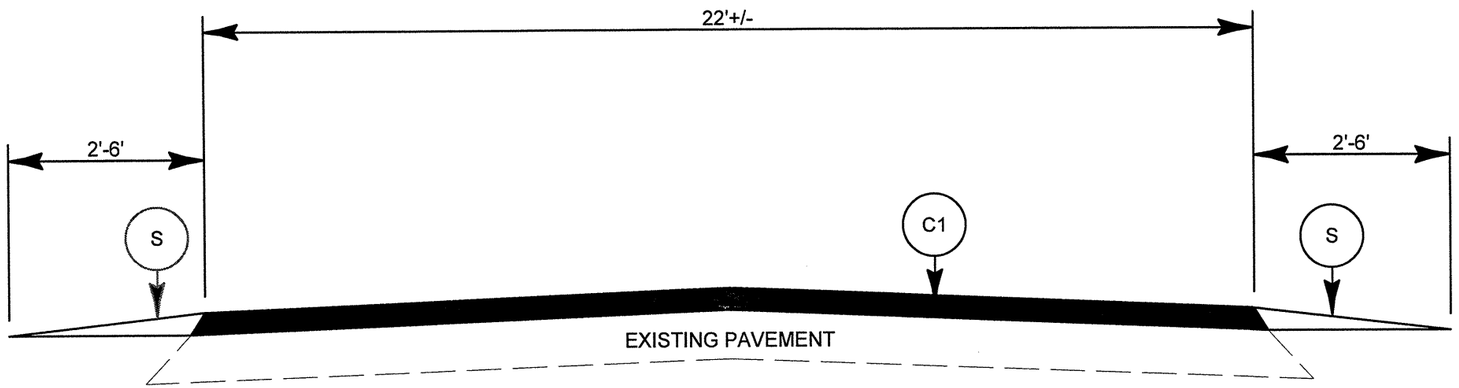
NOTES

ALL UNPAVED ROADS TO BE RESURFACED 50' FROM EDGE OF PAVEMENT OF MAIN PROJECT.
ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII, OR AS DIRECTED BY THE ENGINEER.
EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.
SHOULDERS AND DITCHES ARE TO BE CONSTRUCTED BY OTHERS UNLESS OTHERWISE INDICATED.
BRIDGES ARE TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5C.035046, 5C.091030, 5C.091034, ETC.	5	

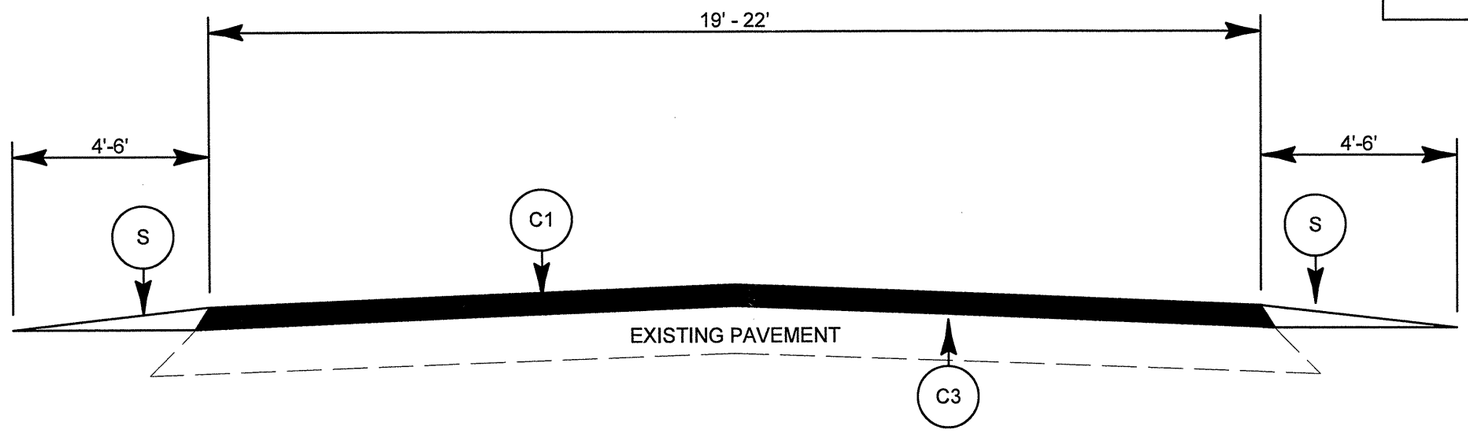


TYPICAL SECTION NO. 5

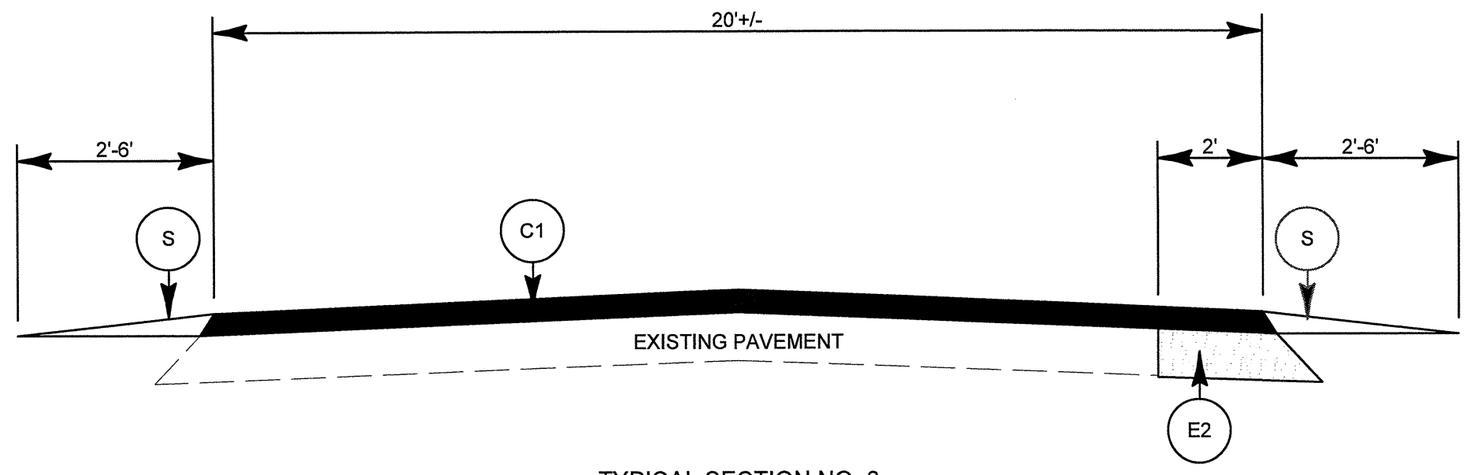


TYPICAL SECTION NO. 6

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5C.035046, 5C.091030, 5C.091034, ETC.	6	

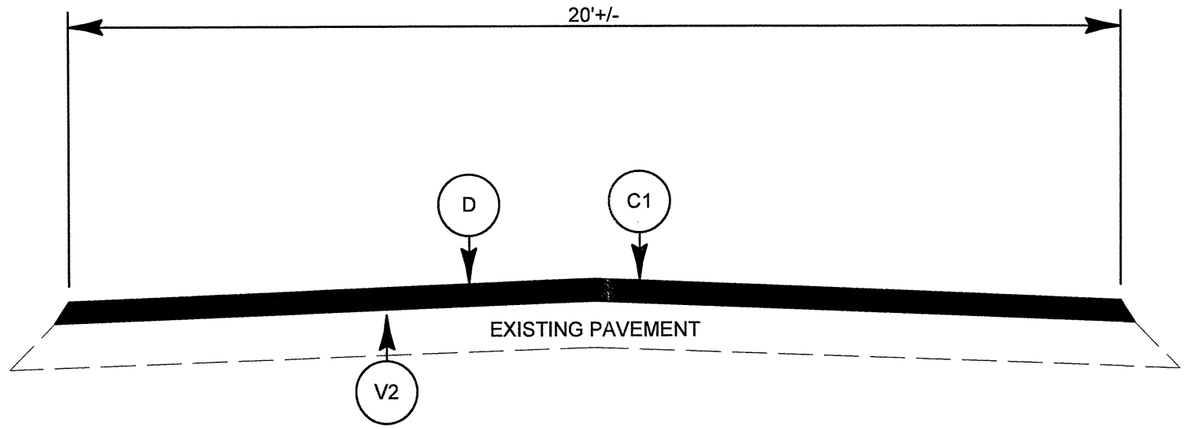


TYPICAL SECTION NO. 7

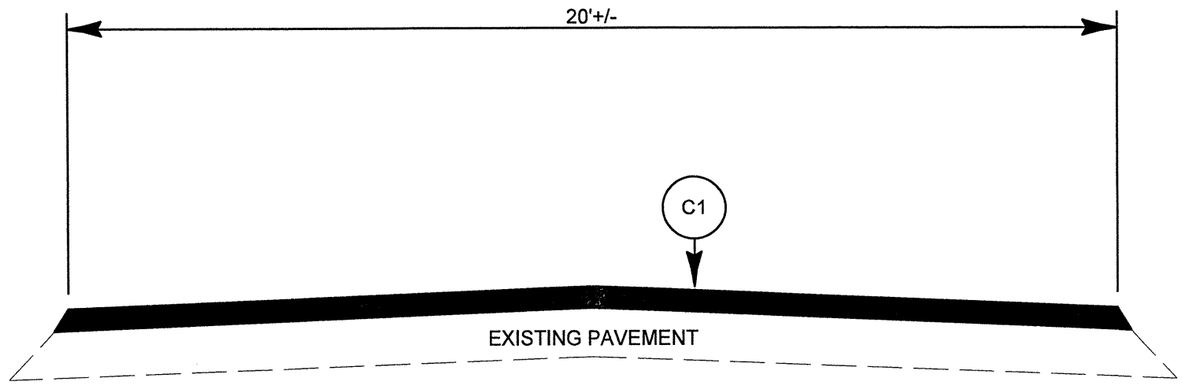


TYPICAL SECTION NO. 8

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5C.035046, 5C.091030, 5C.091034, ETC.	7	

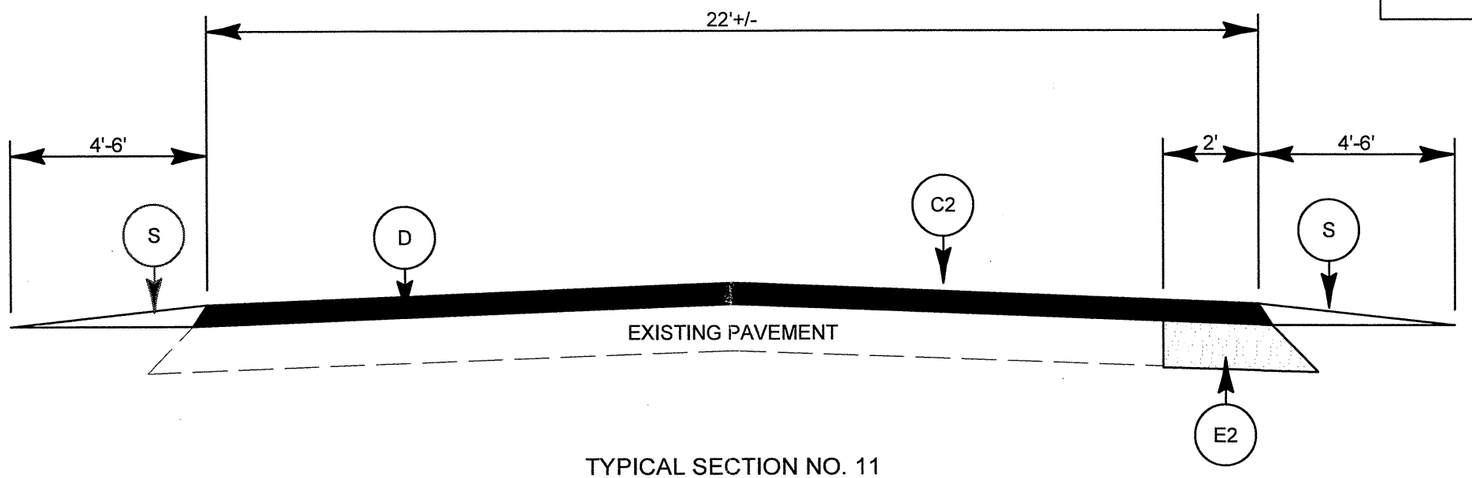


TYPICAL SECTION NO. 9

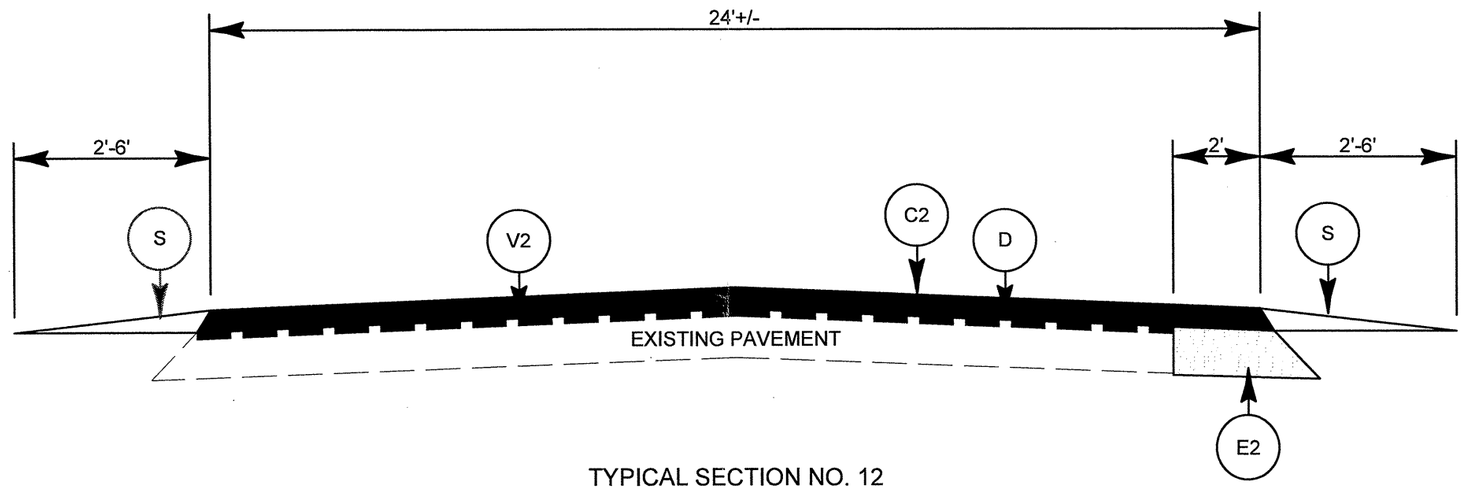


TYPICAL SECTION NO. 10

PROJECT NO.	SHEET NO.	TOTAL SHEETS
5C.035046, 5C.091030, 5C.091034, ETC.	8	



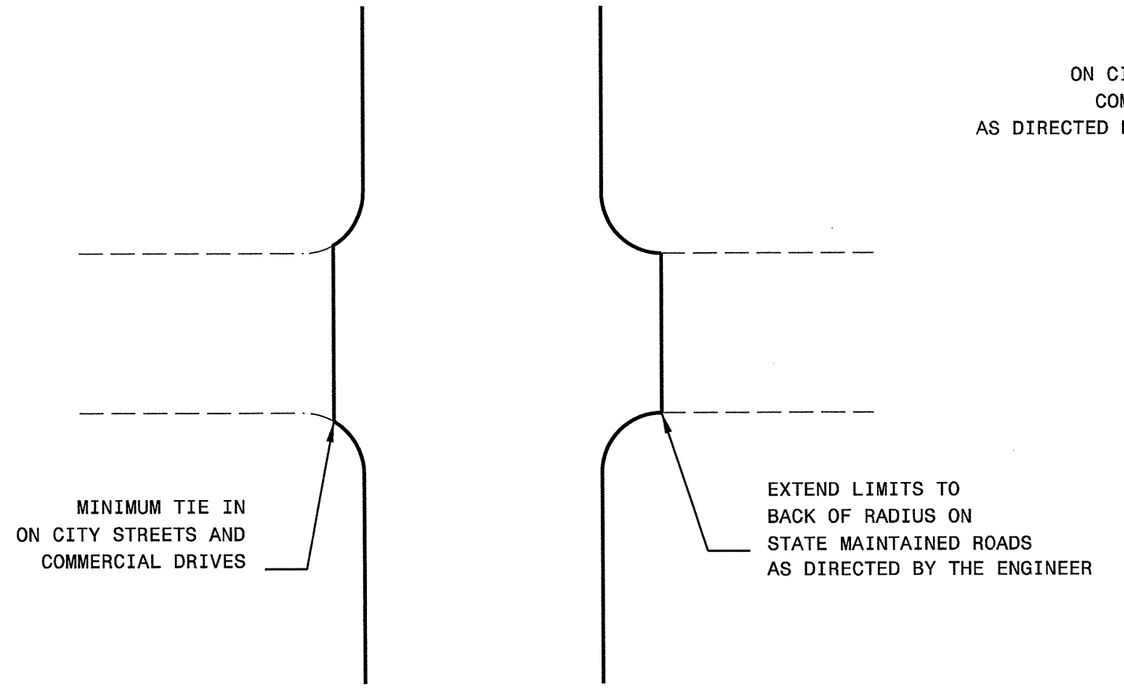
TYPICAL SECTION NO. 11



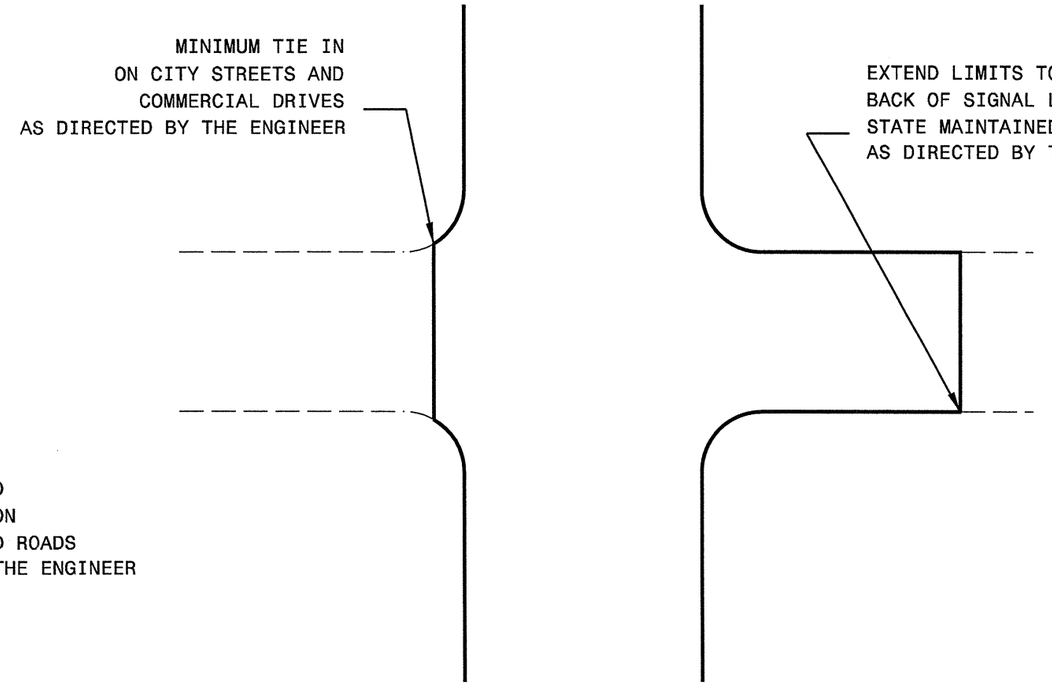
TYPICAL SECTION NO. 12

1 1/2" MILLING TO BE USED AT BRIDGE LOCATIONS
AS DIRECTED BY THE ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
SC.035046	9

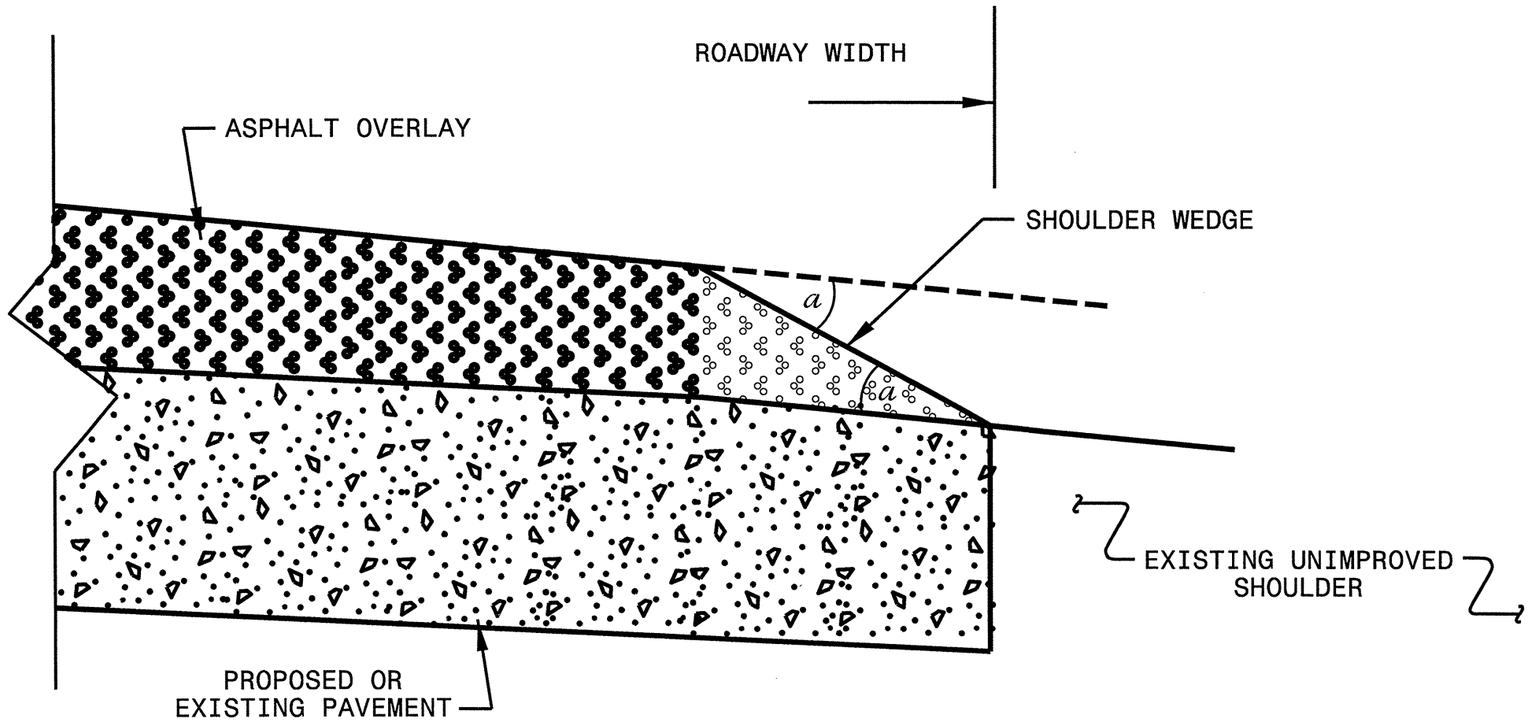


DETAIL OF PROJECT LIMITS AT
UNSIGNALIZED Y LINES



DETAIL OF PROJECT LIMITS AT
SIGNALIZED Y LINES

PROJECT REFERENCE NO.	SHEET NO.
SC.035046	10



a - SHOULDER WEDGE ANGLE (30°)

SHOULDER WEDGE DETAIL

USE ON MAP 11 (SR 1003 - SIMS BRIDGE ROAD) WITH TYPICAL SECTION 3

SHOULDER WEDGE DETAIL

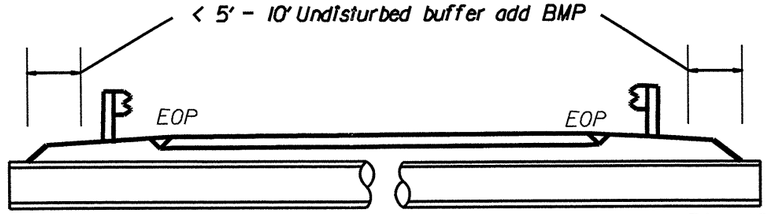
ORIGINAL BY:_____ DATE:_____
MODIFIED BY:_____ DATE:_____
CHECKED BY:_____ DATE:_____
FILE SPEC.:_____

$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

NOTES: Less than 5' - 10' undisturbed buffer from ROW, ditchline, water feature, or drainage inlet, add BMP.

BMP Options: Wattle, Silt Fence, or Hardened Aggregate.

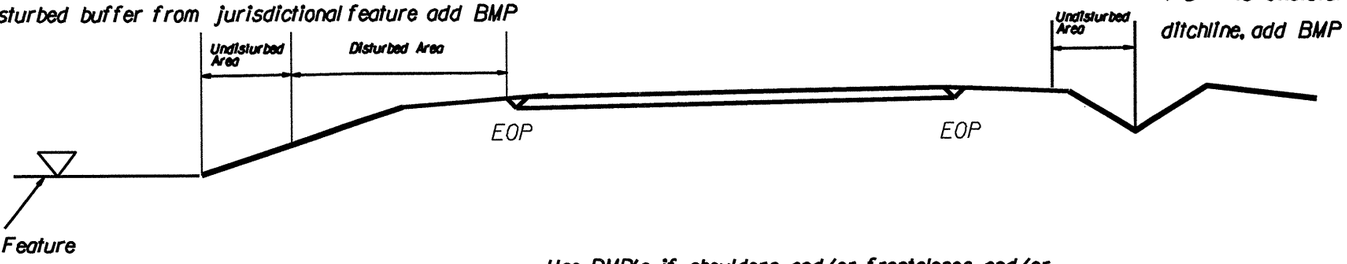
EROSION CONTROL DETAIL



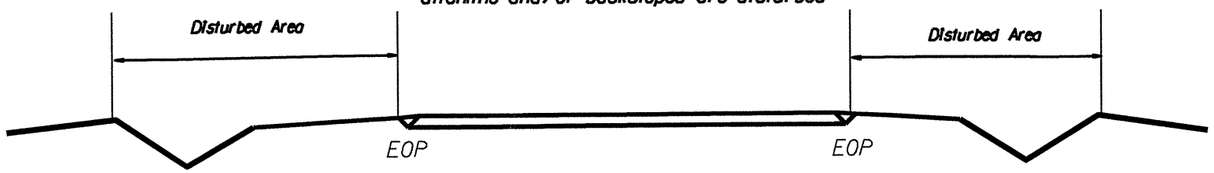
Pipe/Culvert

< 5' - 10' Undisturbed buffer from jurisdictional feature add BMP

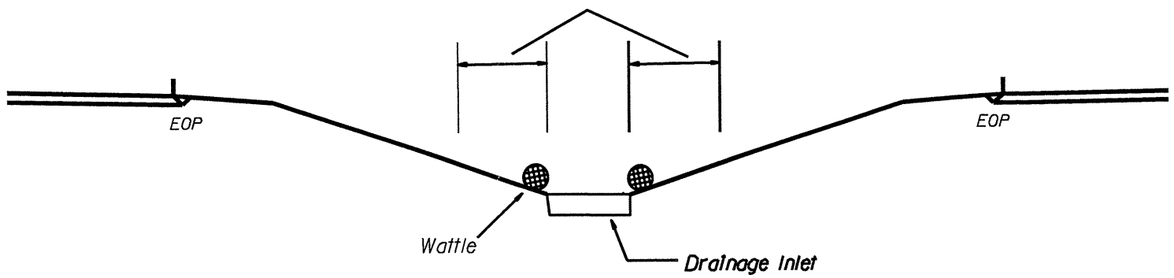
< 5' - 10' Undisturbed buffer from ditchline, add BMP



Use BMP's if shoulders and/or frontslopes and/or ditchline and/or backslopes are disturbed



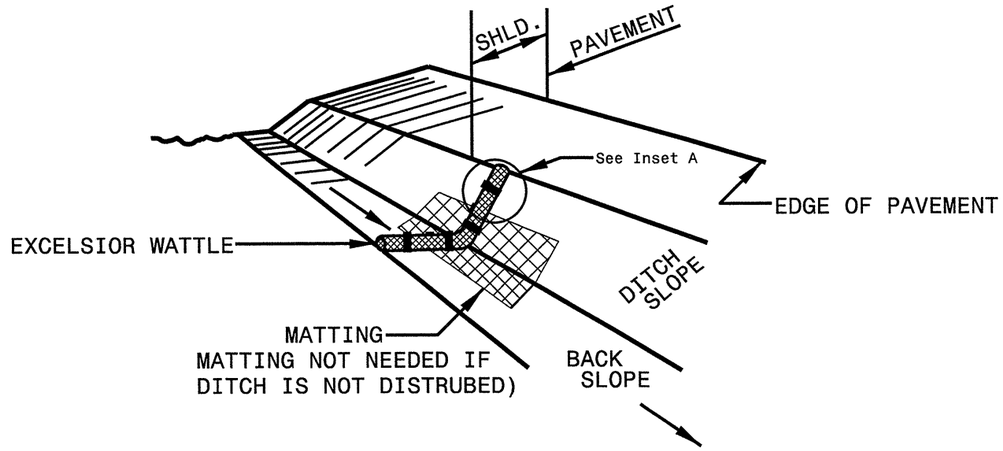
< 5' - 10' Undisturbed buffer from inlet, add wattle



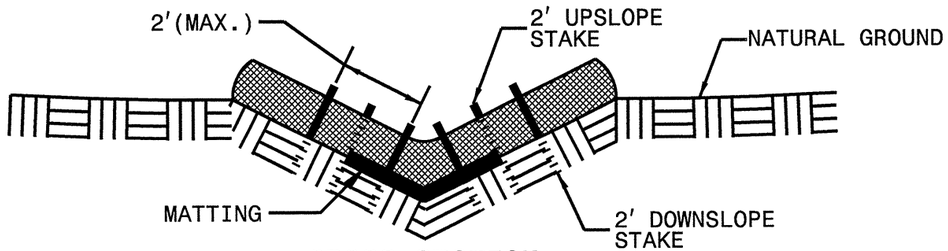
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
X-XXXX	EC-26

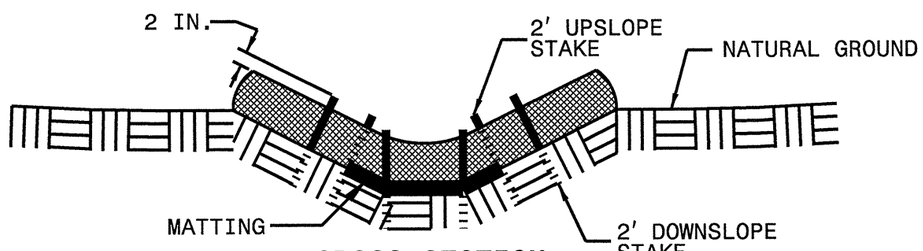
WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

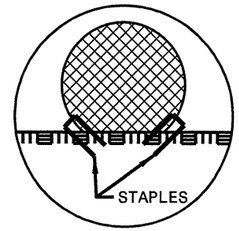
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

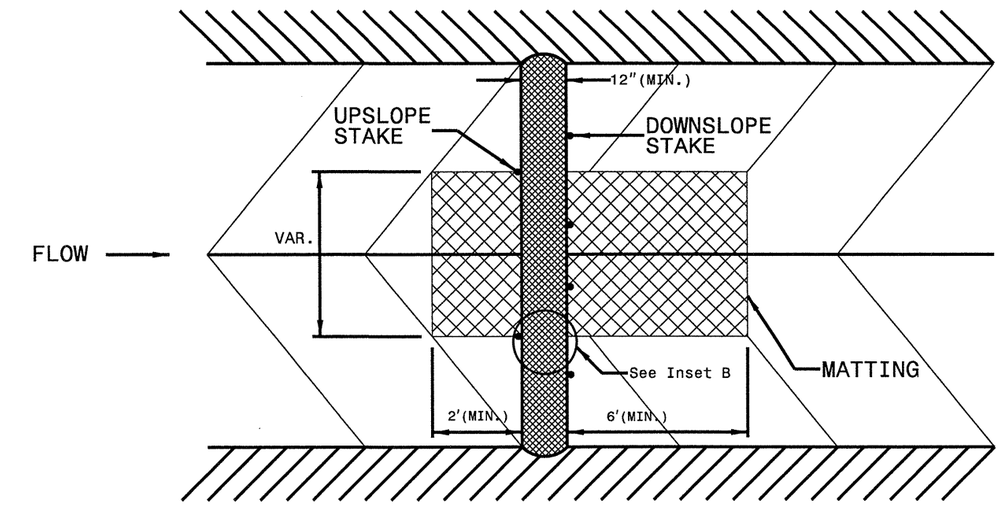
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

IF DITCH WILL BE DISTURBED, INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

INSET A



INSET B



TOP VIEW

PROJECT NO.	SHEET NO.	TOTAL NO.
5C.035046, 5C.091030	13	
5C.091034, ETC.		

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	FINAL SURFACE TESTING REQUIRED	SAFETY WEDGE	LENGTH MI	WIDTH FT	BORROW CY	INCIDENTAL STONE BASE TONS	SHOULDER RECON-STRUCTION SMI	4" MILLING SY	1½" MILLING SY	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	INTER-MEDIATE COURSE, I19.0B TONS	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, SF9.5A TON	LEVELING COURSE, TYPE SF9.5A TONS	ASPHALT BINDER FOR PLANT MIX TON	PATCHING EXISTING PAVEMENT TONS	TEMPORARY SILT FENCE LF	WATTLE LF	SEED & MULCHING AC	INDUCTIVE LOOP LF	LEAD-IN CABLE (14-2) LF
5C.035046	Franklin	1	SR 1003 (SIMS BRIDGE ROAD)	FROM SR 1243 (WALTER GRISSOM RD.) TO SR 1239 (ROCKY FORD ROAD)	2	NO	NO	4.7	23							4,350	9,119				629	200	1,200	300			
TOTAL FOR PROJ NO. 5C.035046								**4.7**								**4,350**	**9,119**				**629**	**200**	**1,200**	**300**			
5C.091030	Vance	2	SR 1101 (COUNTY HOME ROAD)	FROM SR 1107 (BRIGGS RD.) TO SR 1115 (N. LYNNBANK RD)	3	NO	NO	1.25	23	975	15	2.50					2,425		1,441		213			50	1.25		
TOTAL FOR PROJ NO. 5C.091030								**1.25**		**975**	**15**	**2.50**					**2,425**		**1,441**		**213**			**50**	**1.25**		
5C.091034	Vance	3	SR 1550 (ROCKY FORD)	FROM SR 1549 TO FRANKLIN CO. LINE	2	NO	NO	0.5	23	391	6	1.00				450	970		576		105	100		50	0.73		
TOTAL FOR PROJ NO. 5C.091034								**0.5**		**391**	**6**	**1.00**				**450**	**970**		**576**		**105**	**100**		**50**	**0.73**		
5CR.20351.11	Franklin	4	SR 1611 (SLEDGE ROAD)	FROM NC 98 TO SR 1609 BAPTIST CHURCH ROAD	5	NO	NO	3	21	700	36	6.00				700			3,159	947	306	100	400	200	4.35		
5CR.20351.11	Franklin	5	SR 1106 (MOORES POND ROAD) DELETE BRIDGE PROJECT AREA	FROM SR 1100 (TARBORO RD.) TO NC 98	7	NO	NO	2.3	22	200	55	4.60							2,537	761	221	100	200	200	2.25		
5CR.20351.11	Franklin	6	SR 1422 (STRANGE ROAD)	FROM NC 56 TO SR 1421 (HICKORY ROCK RD.)	7	NO	NO	1.5	19	230	18	3.00							1,430	429	125	50		100	1.80		
5CR.20351.11	Franklin	7	SR 1243 (WALTER GRISSOM RD)	FROM VANCE CO. LINE TO CONCORD BAPTIST CHURCH	8	NO	NO	2.9	20	450	35	5.80				250			2,825		200	50		150	2.80		
5CR.20351.11	Franklin	8	SR 1140 (JOHN MITCHELL)	FROM NC 96 TO SR 1139 (SID MITCHELL)	8	NO	NO	2.3	20	800	46	4.60				150			2,308		161	100		200	3.30		
5CR.20351.11	Franklin	9	SR 1606 (BERN WILDER)	FROM NC 39 TO SR 1653 (MUTT WINSTEAD)	6	NO	NO	1.1	20	160	13	2.20							1,104		74	50		100	1.60		
5CR.20351.11	Franklin	10	SR 1784 (HERBERT DRIVE)	FROM NC 39 TO SR 1801 (DELANO CT.)	9	NO	NO	0.35	20				4,107				691		391		57						
		"	"	FROM SR 1801 (DELANO CT.) TO SR 1746	10	NO	NO	0.4	20										440		29	100					
5CR.20351.11	Franklin	11	SR 1003 (SIMS BRIDGE ROAD)	FROM SR 1243 (WALTER GRISSOM RD.) TO SR 1239 (ROCKY FORD RD)	2	NO	YES	4.7	23	1,819	56	9.40							5,313		356				6.80		
TOTAL FOR PROJ NO. 5CR.20351.11								**18.55**		**4,359**	**259**	**35.60**	**4,107**			**1,100**	**691**		**19,507**	**2,137**	**1,529**	**550**	**600**	**950**	**22.90**		
5CR.20911.11	Vance	12	SR 1001 (WARRENTON RD)	FROM US 158 TO SR 1507 (BROOKSTON)	1	NO	NO	1.8	26	300	43	3.60		29,000				2,387			143	100		100	2.62		
5CR.20911.11	Vance	13	SR 1115 (LYNNBANK RD.)	FROM US 1 TO SR 1101	6	NO	NO	2.5	23	400	50	5.00							2,882		193	100		200	2.40	225	50
5CR.20911.11	Vance	14	SR 1303 (HICKSBORO RD)	FROM SR 1326 (KELLY RD.) TO SR 1308 (GLEBE ROAD)	4	NO	NO	1.85	21	175	22	3.70		22,792		550			1,892		151	150		100	1.80		
5CR.20911.11	Vance	15	SR 1546 (PETER GILL ROAD)	FROM US 1 BUS. TO SR 1547 (ABBOTT ROAD)	11	NO	NO	1.3	22	640	16	2.60			350	200	2,414	1,417			210	1,100	150	100	1.90		
5CR.20911.11	Vance	16	SR 1148 (EPSON ROAD)	FROM SR 1143 (WILLIAMS ST) TO EAST SIDE OF US 1 BRIDGE	12	NO	NO	1.6	25	250	19	3.20	23,300	320	800	450	3,372	1,981			314	150		100	1.55		
TOTAL FOR PROJ NO. 5CR.20911.11								**9.05**		**1,765**	**150**	**18.10**	**23,300**	**52,112**	**1,150**	**1,200**	**5,786**	**5,785**	**4,774**		**1,011**	**1,600**	**150**	**600**	**10.27**	**225**	**50**
GRAND TOTAL								**34.05**		**7,490**	**430**	**57.20**	**27,407**	**52,112**	**1,150**	**7,100**	**18,991**	**5,785**	**26,298**	**2,137**	**3,487**	**2,450**	**1,950**	**1,950**	**35.15**	**225**	**50**

PROJECT NO.	SHEET NO.	TOTAL NO.
5C.035046, 5C.091030	14	
5C.091034, ETC.		

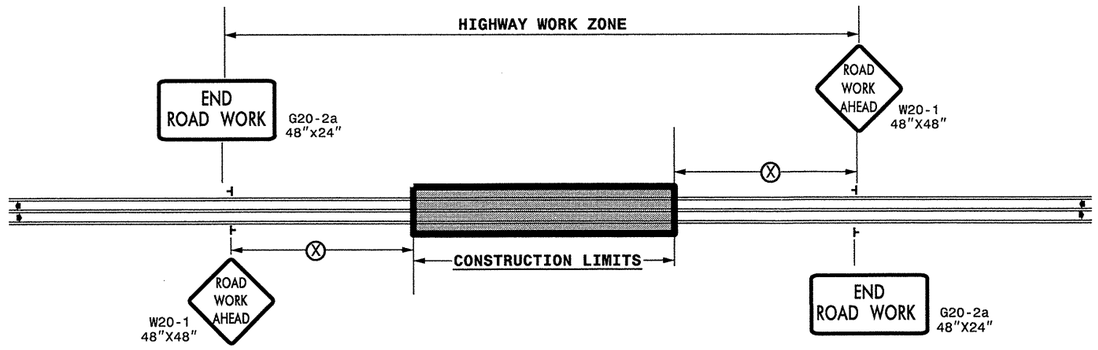
THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	LENGTH	WIDTH	4685000000-E 4" X 90 M WHITE THERMO LF	4686000000-E 4" X 120 M YELLOW THERMO LF	4686000000-E 4" X 120 M WHITE THERMO LF	4695000000-E 8" X 90 M YELLOW THERMO LF	4705000000-E 16" X 120 M WHITE THERMO LF	4710000000-E 24" X 120 M WHITE THERMO LF	4721000000-E THERMO RXR 120 M EA	4721000000-E THERMO MSG SCHOOL 120 M EA	4725000000-E THERMO LT ARROW 90 M EA	4725000000-E THERMO STR ARROW 90 M EA	4725000000-E THERMO RT ARROW 90 M EA	4810000000-E 4" WHITE PAINT LF	4810000000-E 4" YELLOW PAINT LF	4830000000-E 16" WHITE PAINT LF	4835000000-E 24" WHITE PAINT LF	4840000000-N PAINT MSG RXR EA	4840000000-N PAINT MSG SCHOOL EA	4845000000-N PAINT LT ARROW EA	4845000000-N PAINT STR ARROW EA	4845000000-N PAINT RT ARROW EA	4900000000-N YELLOW & YELLOW MARKERS EA	4900000000-N CRYSTAL & RED MARKERS EA
5C.035046	Franklin	1	SR 1003 (SIMS BRIDGE ROAD)	FROM SR 1243 (WALTER GRISSOM RD.) TO SR 1239 (ROCKY FORD ROAD)	4.7	23												100,000	87,000									
					4.7													100,000	87,000									
TOTAL FOR PROJ NO. 5C.035046																		187,000										
5C.091030	Vance	2	SR 1101 (COUNTY HOME ROAD)	FROM SR 1107 (BRIGGS RD.) TO SR 1115 (N. LYNNBANK RD)	1.25	23	13,450	8,250										13,450	8,250									
					1.25		13,450	8,250										13,450	8,250									
TOTAL FOR PROJ NO. 5C.091030								8,250										21,700										
5C.091034	Vance	3	SR 1550 (ROCKY FORD)	FROM SR 1549 TO FRANKLIN CO. LINE	0.5	23	5,380	3,300																				
					0.5		5,380	3,300																				
TOTAL FOR PROJ NO. 5C.091034								3,300																				
5CR.20351.11	Franklin	4	SR 1611 (SLEDGE ROAD)	FROM NC 98 TO SR 1609 BAPTIST CHURCH ROAD	3	21	32,280	19,800																			198	
5CR.20351.11	Franklin	5	SR 1106 (MOORES POND ROAD) DELETE BRIDGE PROJECT AREA	FROM SR 1100 (TARBORO RD.) TO NC 98	2.3	22	24,748	15,180																			152	
5CR.20351.11	Franklin	6	SR 1422 (STRANGE ROAD)	FROM NC 56 TO SR 1421 (HICKORY ROCK RD.)	1.5	19	16,140	9,900																				
5CR.20351.11	Franklin	7	SR 1243 (WALTER GRISSOM RD)	FROM VANCE CO. LINE TO CONCORD BAPTIST CHURCH	2.9	20	31,204	19,140																			191	
5CR.20351.11	Franklin	8	SR 1140 (JOHN MITCHELL)	FROM NC 96 TO SR 1139 (SID MITCHELL)	2.3	20	24,748	15,180																			152	
5CR.20351.11	Franklin	9	SR 1606 (BERN WILDER)	FROM NC 39 TO SR 1653 (MUTT WINSTEAD)	1.1	20	11,836	7,260																				
5CR.20351.11	Franklin	10	SR 1784 (HERBERT DRIVE)	FROM NC 39 TO SR 1801 (DELANO CT.)	0.35	20		3,700											3,700									
		"	"	FROM SR 1801 (DELANO CT.) TO SR 1746	0.4	20		4,200																				
5CR.20351.11	Franklin	11	SR 1003 (SIMS BRIDGE ROAD)	FROM SR 1243 (WALTER GRISSOM RD.) TO SR 1239 (ROCKY FORD RD)	4.7	23	50,572	31,020																			693	
TOTAL FOR PROJ NO. 5CR.20351.11					18.55		191,528	125,380										3,700									693	
								125,380																				
5CR.20911.11	Vance	12	SR 1001 (WARRENTON RD)	FROM US 158 TO SR 1507 (BROOKSTON)	1.8	26	19,368	11,880			100	220	4	12	5			19,368	11,880	100.00	220	4	12	5			119	
5CR.20911.11	Vance	13	SR 1115 (LYNNBANK RD.)	FROM US 1 TO SR 1101	2.5	23	26,900	16,500																			165	
5CR.20911.11	Vance	14	SR 1303 (HICKSBORO RD)	FROM SR 1326 (KELLY RD.) TO SR 1308 (GLEBE ROAD)	1.85	21	19,906	12,210										19,906	22,589									
5CR.20911.11	Vance	15	SR 1546 (PETER GILL ROAD)	FROM US 1 BUS. TO SR 1547 (ABBOTT ROAD)	1.3	22	13,988	8,580			50	25	2					13,998	9,580	50	25	2						
5CR.20911.11	Vance	16	SR 1148 (EPSON ROAD)	FROM SR 1143 (WILLIAMS ST) TO EAST SIDE OF US 1 BRIDGE	1.6	25	17,216	10,560	100	100		50			4	3	4	17,716	21,120		100			4	3	4	106	20
					9.05		97,378	59,730	100	100	150	295	6	12	9	3	4	70,988	65,169	150	345	6	12	9	3	4	390	20
TOTAL FOR PROJ NO. 5CR.20911.11								59,830					18		16			136,157				18		16			410	
GRAND TOTAL					34.05		307,736	196,660	100	100	150	295	6	12	9	3	4	184,438	164,119	150	345	6	12	9	3	4	1,083	20
								196,760					18		16			348,557				18		16			1,103	

5C.035046 5CR.20351.11
5C.091030 5CR.20911.11
5C.091034

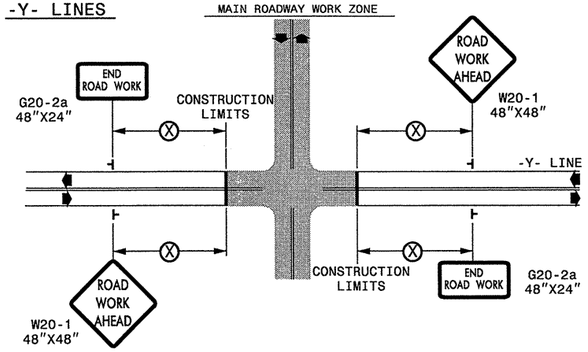
PROJ. REFERENCE NO.	SHEET NO.
SEE LEFT	TCP-1

TWO-WAY UNDIVIDED ** (L-LINES)



POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING Ⓧ
≤ 50	500′
≥ 55	1000′

ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)



GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01. REMOVE ENTIRE POST WHEN REMOVING SIGNS WITH SPLICED POSTS.
- DO NOT BACK BRACE SIGN SUPPORTS.
- ** TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND

- ⊢ STATIONARY SIGN
- ⬅ DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

DETAIL DRAWING FOR TWO-WAY UNDIVIDED WORK ZONE WARNING SIGNS

SHEET 1 OF 1

APPROVED:_____ DATE:_____

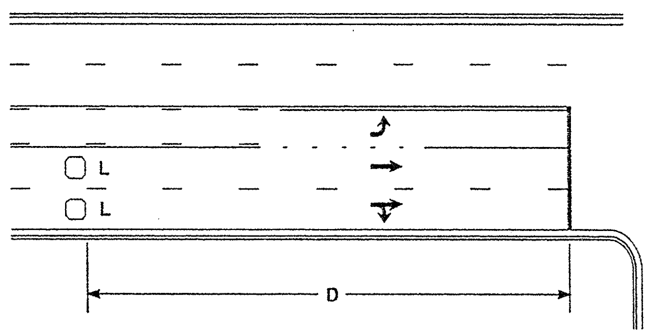
SEAL

DETAIL DRAWING FOR TWO-WAY UNDIVIDED AND URBAN FREEWAYS ADVANCED WORK ZONE WARNING SIGNS

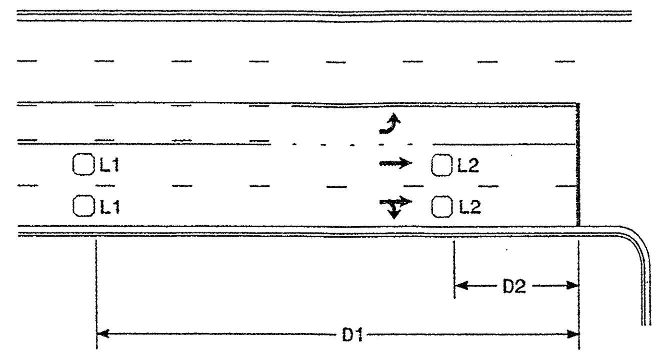
SCALE: NONE	REVISIONS	
DATE:	7-98	10/01
DWG. BY:	10-98	03/04
DESIGN BY:	01/01	11/04
REVIEWED BY:	CADD FILE	

PROJECT REFERENCE NO.	SHEET NO.
5C.035046,etc.	SIG 1

High Speed Detection
[≥40 mph (64 km/hr)]



OR



Speed Limit mph (km/hr)	D ft	(m)
40 (64)	250	(75)
45 (72)	300	(90)
50 (80)	355	(110)
55 (88)	420	(130)

L = 6ft X 6ft (1.8m X 1.8m)
Wired in series for TS1 Controllers
Wired separately for TS2, 170, and 2070L Controllers

Volume Density Operation

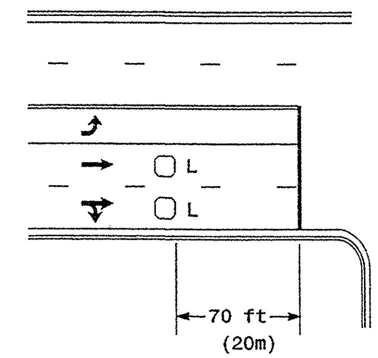
Speed Limit mph (km/hr)	D1 ft	(m)	D2 ft	(m)
40 (64)	250	(75)	80	(25)
45 (72)	300	(90)	90	(27)
50 (80)	355	(110)	100	(30)
55 (88)	420	(130)	110	(35)

L1 = 6ft X 6ft (1.8m X 1.8m) Wired in series

L2 = 6ft X 6ft (1.8m X 1.8m) Wired in series

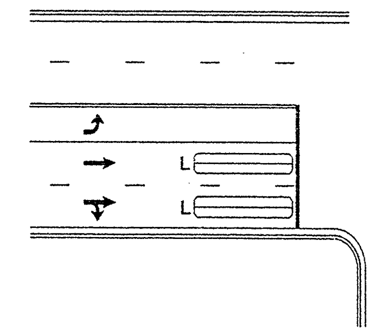
"Stretch" Operation

Low Speed Detection
[≤35 mph (56 km/hr)]



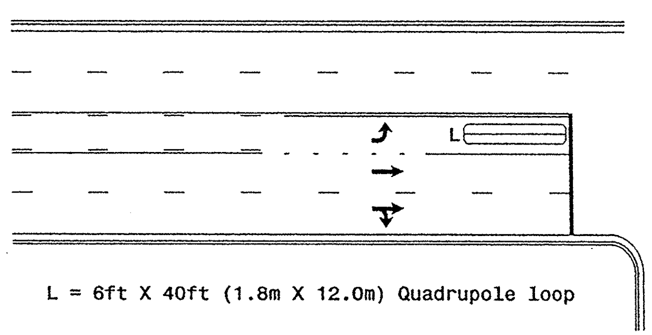
L = 6ft X 6ft (1.8m X 1.8m)
Wired in series

OR



L = 6ft X 40ft (1.8m X 12.0m)
Quadrupole loop, wired separately

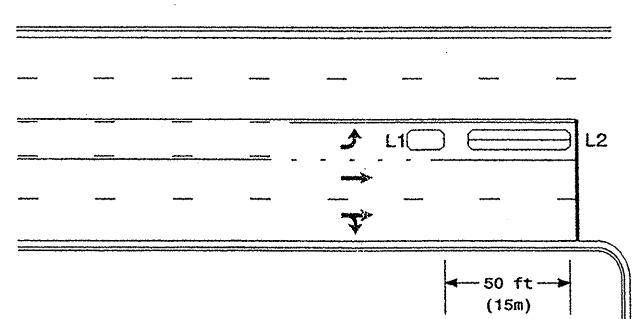
Left Turn Lane Detection



L = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

Presence Loop Detection

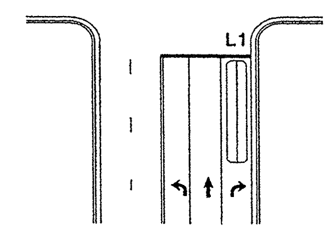
OR



L1 = 6ft X 15ft (1.8m X 4.6m) Queue detector
L2 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

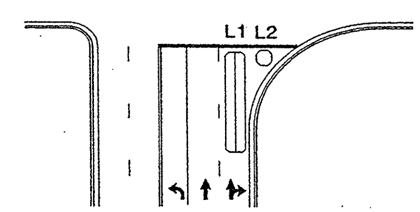
Queue Loop Detection

Right Turn Lane Detection

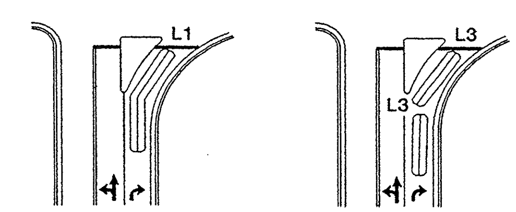


Standard Turn

L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop
Wired separately
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop
Wired in series

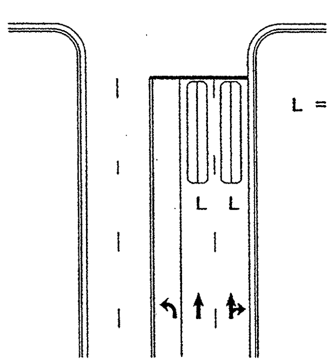


Wide Radius Turn



Channelized Turn

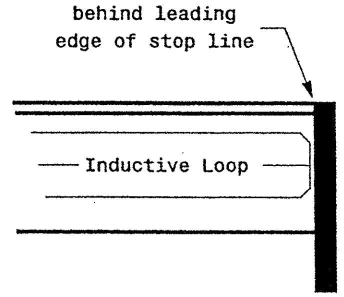
Side Street Detection



L = 6ft X 40ft (1.8m X 12.0m)
Quadrupole loop
Wired to separate detectors/channels

Presence Loop Placement at Stop Lines

Locate loop slightly behind leading edge of stop line



Note:
Loop may be located in advance of stop line when stop line is greater than 15′ (4.5m) from edge of intersecting roadway; or, when loop detects a permissive or protected/permissive left turn.

Recommended Number of Turns

Single 6′ X 6′ (1.8m X 1.8m) loop (wired separately):

Length of Lead-in ft (m)	Number of Turns
< 250 (75)	3
250-375 (75-115)	4
375-525 (115-160)	5
> 525 (160)	6

Quadrupole loops: Use 2-4-2 turns

6′ X 15′ (1.8m X 4.6m) Loops:
Lead-in < 150′ (45 m), use 2 turns
Lead-in > 150′ (45 m), use 3 turns

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section, North Carolina Department of Transportation
122 N. McDowell St., Raleigh, NC 27603

SCALE
N/A

Typical Loop Locations

PLAN DATE: June 2006 REVIEWED BY:
PREPARED BY: P L Alexander REVIEWED BY:

REVISIONS	INIT.	DATE
Revise pavement markings		

SEAL
North Carolina Professional Engineer SEAL 23488 P. L. Alexander
6/6/06
SIGNATURE DATE
SIG. INVENTORY NO.

19-DEC-2006 14:29
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palexander

PROJECT REFERENCE NO.	SHEET NO.
5C.035046,etc.	Sig. 2

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

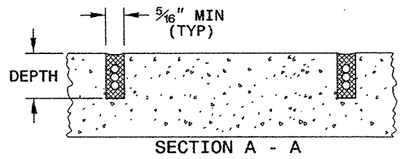
ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

CONVENTIONAL 4-SIDED LOOP

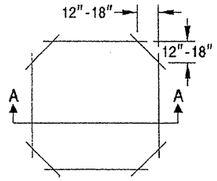
SAW SLOT DEPTH CHART

DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0

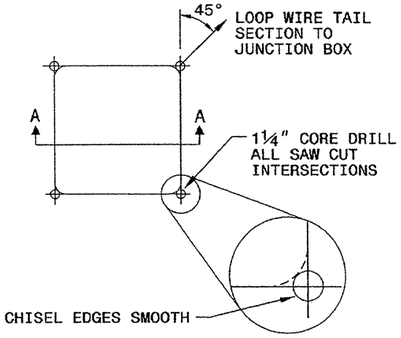


SAW CUT OPTIONS

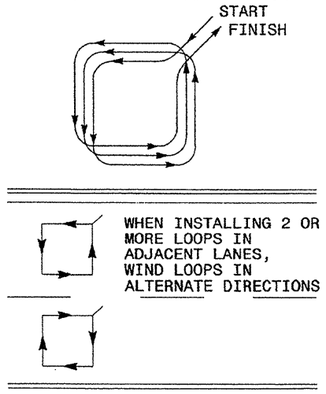
OPTION 1



OPTION 2 (POOR PAVEMENT)



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE

CORRECT WAY TO TWIST WIRE

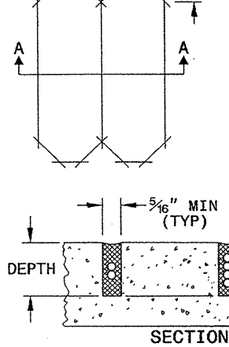
NOTES

1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

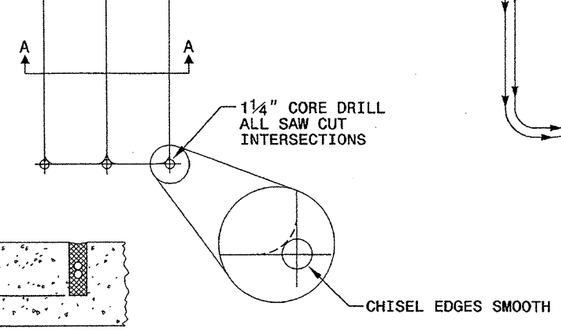
QUADRUPOLE LOOP

SAW CUT OPTIONS

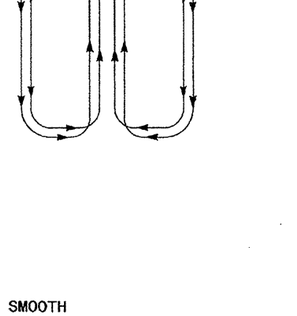
OPTION 1



OPTION 2 (POOR PAVEMENT)



LOOP WINDING METHOD



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

SHEET 1 OF 3
1725D01

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:
Intelligent Transportation Systems & Signals Unit
750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON J. DEAN
SIGNATURE
11/24/08
DATE

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zmilitte

PROJECT REFERENCE NO.	SHEET NO.
5C.035046,etc.	Sig.3

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

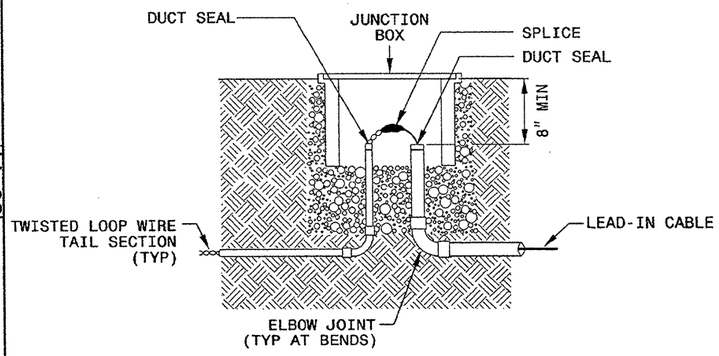
LOOP WIRE DETAILS

SHEET 2 OF 3

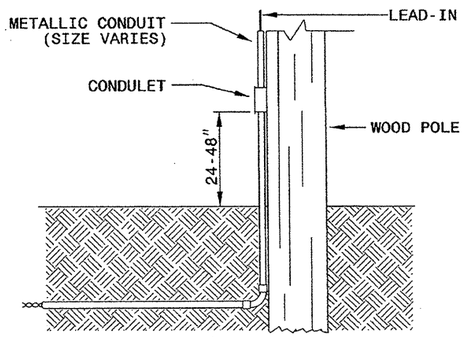
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

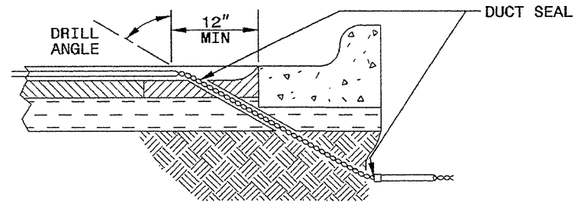


NOTE

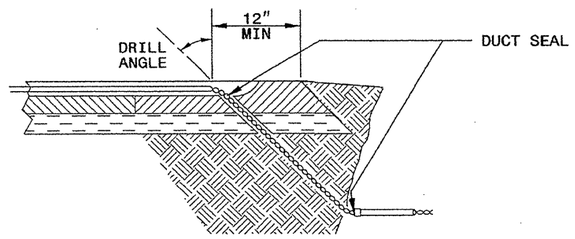
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

1. DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
2. TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
3. BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

LOOP WIRE DETAILS

SHEET 2 OF 3

1725D01

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zmiller

See Plate for Title

Prepared in the Offices of:

Intelligent Transportation Systems & Signals Unit
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON L. DEAN

Milton L. Dean 11/24/08
SIGNATURE DATE

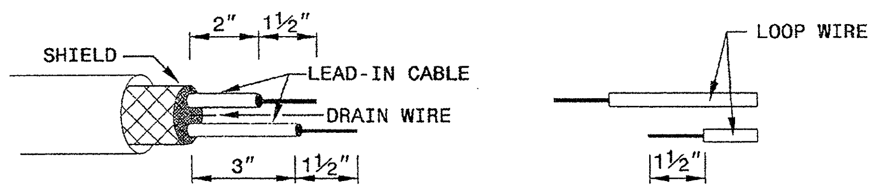
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

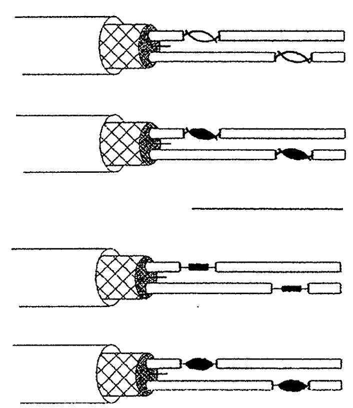
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE



STEP 2. CONNECT AND SOLDER



TWIST BARE CONDUCTORS TOGETHER AND SOLDER WITH RESIN CORE SOLDER

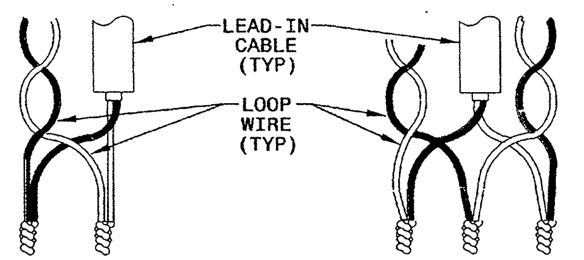
OR

CRIMP BARE CONDUCTORS TOGETHER WITH AN UNINSULATED BUTT CONNECTOR AND SOLDER WITH RESIN CORE SOLDER

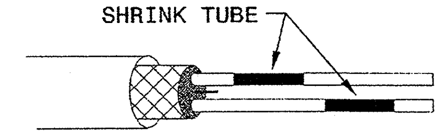
BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS

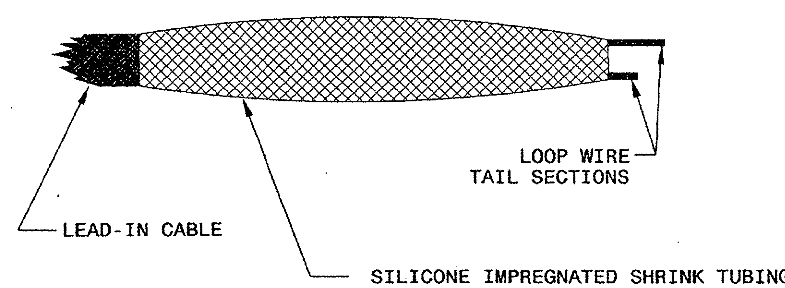
SINGLE CONNECTION | SERIES CONNECTION



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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See Plate for Title

Prepared in the Offices of:
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